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ABSTRACT

This national study of colleges and universities examined 33 variables found to act as incentives to motivate faculty to engage in grant-related activities. A survey questionnaire was sent to 163 colleges and universities, and of these, 104 returned them. The results of a series of statistical analyses suggested that a small, but significant, predictive relationship exists between the provision of institutional resources for released time to write proposals, reduced faculty loads to work on successful grants, graduate and research assistants, a return of some of the indirect costs to faculty or sponsoring departments, and other selected resources and services, and success in grants acquisition as measured by the amount of funding attracted to the institutions in successful grants. The results also suggest that institutions may prefer to look to successful grants to fund released time, reduced faculty loads, and other resource-consuming incentives as a way of avoiding having to expend institutional resources to support grant-related activities. Finally, overall, most colleges and universities provide more in the form of policies, practices, grants training and other services than financial and other institutional resources, such as released time, as incentives. (Author/JB)

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USING INSTITUTIONAL VARIABLES TO PREDICT SUCCESS IN GRANTS ACQUISITION

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This national study of colleges and universities examined thirty-three variables found to act as incentives to motivate faculty to engage in grant-related activities. The results of a series of statistical analyses suggests that a small, but significant, predictive relationship exists between the provision of institutional resources for released time to write proposals, reduced faculty loads to work on successful grants, graduate and research assistants, a return of some of the indirect costs to faculty or sponsoring departments, and other selected resources and services, and success in grants acquisition as measured by the amount of funding attracted to the institutions in successful grants.

Background of the Study

Several recent studies identify factors which serve as incentives or disincentives to college and university faculty participation in grant-related activity (Monahan, 1993; Davis & O'Hanlon, 1992; Stahler & Tash, 1992; Snyder, McLaughlin, & Montgomery, 1990; Daniel & Gallaher, 1990; Mishler, 1989). While these studies are useful in identifying factors that are said to help and hinder grant-related activity, each possesses certain limitations. For example, Monahan's 1993 study identified barriers and inducements to faculty participation in grants and sponsored activity, but only within the New Jersey state college system. Davis & O'Hanlon (1992) surveyed grants and contracts activity among colleges of education. Stahler & Tash (1992) studied incentives and impediments to grant development at the nation's fastest growing research

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universities; Snyder, McLaughlin, & Montgomery (1990) conducted a national survey of outstanding research universities which focused primarily on successful management practices in encouraging faculty research. Daniel & Gallaher (1990) studied impediments in grant-related activity in a small sample of education faculty. Mishler (1989) examined the steps necessary for the transition from predominantly teaching-institutions to those in which the focused emphasis is placed on acquisition of sponsored research funds.

Having identified the motivating and inhibiting variables, the next reasonable question is whether the addition of incentives or the removal of barriers has any empirical effect on the success of grants acquisition. The purpose of this research was to conduct a nationally representative study of the kinds of grant-related support mechanisms that were provided by colleges and universities using their own as opposed to grant-funded resources, the types of policies and practices of the colleges and universities that supported grant-related activity, and the kinds of training and services provided by the campus grants, sponsored projects or research administration offices. Moreover, we wanted to determine if there is a connection between the institutionally-funded services, policies, and training provided by colleges and universities and success in grants acquisition as measured by the percent of proposals submitted that received funding and/or by the amount of funding that was received in successful grants.

Specifically, the objectives of this study were:

1. to conduct a nationally representative survey of colleges and universities to determine the nature and frequency of institutionally-funded financial and other resources that are provided to support faculty participation in grant-related activities;

2. to determine the extent to which selected institutional policies and practices which tend

to influence grant-related activity are provided by colleges and universities;

3. to determine the extent to which selected training and other services in grant development are provided by college and university grants, sponsored projects, or research administration offices; and

4. using the percent of successfully funded proposals and amount of dollars awarded in funded proposals as dependent criterion values, to determine whether institutionally-funded support services, college or university policies and practices, and grants training and other services accurately predict success in grants acquisition.

Sampling Procedures and Survey Methodology

Two separate samples were drawn for this study. The first sample was identified from the colleges and universities who participated in the *1992 Benchmarking Project* conducted by the National Council of College and University Business Officers (NACUBO) and Coopers & Lybrand. There were 112 institutions participating in the study, and 84 (75%) provided information about their sponsored projects activities, including the number of proposals submitted and awarded and the amount of funding requested and received. All of the institutions which provided sponsored projects information were selected with certainty. The second sample was identified through a systematic random selection of colleges and universities whose representatives were members of the National Council of University Research Administrators (NCURA) and who were listed in the 1993 NCURA member directory. After removing institutions that were already included in the survey sample by virtue of their participation in the NACUBO project, 354 colleges and universities remained, and 79 (22%) were systematically selected for inclusion in the sample. The combined population, therefore, included a total of ~~446~~ 438

colleges and universities from all fifty states and the District of Columbia. A total of 163 institutions, representing 42 states and the District of Columbia, were selected randomly into the combined sample, which was expected to have at least 90% confidence with a margin of error of $\pm$ .05 (McCall, 1990). The sample was checked to ensure national representativeness according to such characteristics as geographic region, type (research vs. non-research), and control (public vs. private).

Survey (mail) questionnaires were developed, field-tested, and distributed to the directors or managers (in some instances, deans and vice provosts) of grants, sponsored projects, or research administration offices who were identified in either the *Benchmarking Project* report or the NCURA Directory. Respondents were instructed not to identify their institutions on the survey instrument, but were asked to return a pre-addressed postal card under separate cover to facilitate follow-up and to assist the researchers in checking the representativeness of the responding sample. One follow-up survey was necessary.

Instrumentation

Two similar survey questionnaires were used in this study. One, which was sent only to institutions in the NCURA sample, requested specific data on the number of proposals for externally sponsored grants or projects that were submitted during FY 93 (i.e. July 1, 1992 - June 30, 1993) by a college or university faculty or staff member, and how many of these proposals resulted in grant awards. Similarly, the NCURA sample was asked to provide specific data on the number of dollars that were requested in the FY 93 proposals, and how many dollars were actually awarded. Respondents were instructed to include only information regarding grants and sponsored projects; contracts and fee-for-services projects were excluded from consideration in

this study. Because the information about number of proposals submitted and awarded and the number of dollars requested and granted was already available from the *1992 Benchmarking Project* report, these data were not requested from institutions included within the NACUBO sample. An unobtrusive coding device permitted us to identify the completed survey instruments from institutions in the NACUBO sample so that we could match their responses with their proposal and funding data recovered from the *1992 Benchmarking Project* report.

The combined sample was asked to respond to a number of questions regarding the nature and type of institutional support features that are available on their campuses. Specifically, all colleges and universities in the study were asked whether their campuses had a functioning grants, sponsored projects or research administration office. They were further asked about the different kinds of *institutionally-funded* financial and other resources that were available on their campuses that are reported in the literature to support grant development activities. Included within the financial resource category were questions about *institutional* (non-grant) funding for faculty travel to professional meetings; equipment and technology that supports grant development; funding for faculty development or faculty renewal projects; merit pay for successful faculty grantees; and matching funds to support institutional proposals. Included within the other resource category were questions about released time for faculty from regularly assigned teaching activities, student advising responsibilities and committee assignments; graduate or research assistants to help faculty prepare proposals or to work on successful grant projects; and extra administrative (e.g., secretarial) help for faculty engaged in grant-related activity. The operative word in all of the questions in these categories was *institutional*. Respondents were clearly instructed to answer questions about the nature of resources provided by their college or

university *from within its own sources*, as opposed to grant-funded.

In addition to financial and other institutional services, respondents were asked to indicate the presence of institutional policies or practices that may affect grant development activities. Specifically, information was sought about whether institutions provided clearly visible support mechanisms for grants enterprises; whether their institutional mission statements included language which demonstrated clear support for externally sponsored activities; whether college and university campuses provided environments where faculty could pursue grants of their own choosing without administration pressure; and whether the institution provided a streamlined administrative process for reviewing and approving proposals for externally sponsored projects. Respondents were also asked to indicate whether their colleges and universities provided a clear system of recognition and rewards for faculty who were successful in securing grants, and whether their colleges and universities had a process which provided for the distribution of indirect or administrative costs attracted to the institutions by successful grants to the faculty and departments responsible for securing and implementing the grants.

Finally, respondents were asked to respond to a series of questions about the services available in their campus grants offices and what training services were offered for faculty. Specifically, respondents were asked to indicate whether their grants, sponsored projects, or research administration offices motivated faculty to engage in grant-seeking and grant-writing; provided boiler-plate writing and editing services for faculty proposals; shepherded faculty proposals through the administrative review and clearance processes; provided timely notification of grants opportunities; maintained faculty interest profiles and assisted in networking faculty with similar research, grants or scholarly interests; and provided access to on-line computerized

databases of potential external sponsors. Respondents were further asked to report whether their grants, sponsored projects, or research administration offices provided training in how to familiarize faculty with grant opportunities; how to locate suitable external sponsors for their ideas; how to prepare competitive proposals and accurate budgets; and how to remain informed about proposal review and approval policies.

In all, there were thirty-three questions asked that would later serve as univariate variables in the data analysis phase. For all of these questions, respondents were asked to answer by checking an *always, sometimes* (or *somewhat*), and *never* (or *none*) option. Several respondents offered that these options may not have been the most appropriate that could have been used. They suggested that some of the questions would better have been answered by a simple *yes-no* dichotomy. Nevertheless, an insignificant number of respondents did not complete the survey in its entirety. Thus, if problems with the response stubs did exist, no discernable effect was observed.

Respondent Characteristics

Usable surveys were returned by 104 of the 163 colleges and universities sampled, a response rate of nearly 64%. Checks were performed of the pre-addressed postal cards (included with the survey questionnaires) that were returned independently of their completed survey instruments that determined that returns were evenly distributed across the national sample. This check further suggested that there was neither substantial over-representation nor under-representation among the respondents on the basis of geography, type, or control. Telephone calls were made to a randomly selected sample of non-respondents which indicated that no systematic non-response bias was present.

Data Analysis

Both proposal and financial grants award data were analyzed to compute percentages of proposals funded and dollars awarded in funded grants. For purposes of analysis, these percentages were then grouped as follows: an *above average* category was identified when the percentage of proposals funded and dollars awarded exceeded 69%; an *average* category was identified when the percentage of proposals funded and dollars awarded was between 69% - 50% inclusive, and a *below average* category was identified when the percentage of proposals funded and dollars awarded fell below 50%. These groupings are presented below in Table 1.

Table 1
Descriptive Statistics: Measures of Success
in Grants Acquisition

Percentage of Proposals Funded	N	Percent
Greater than 69%	28	29.8
50% - 69%	40	42.6
Less than 50%	26	27.7
Percentage of Dollars Awarded in Funded Grants		
Greater than 69%	28	30.4
50% - 69%	36	39.1
Less than 50%	28	30.4

The data in Table 1 show that, for both the *percentage of proposals funded* and for *percentage of dollars awarded*, approximately 30% of the respondents obtained more than 69% of the proposals submitted and dollars requested, approximately 40% of the respondents obtained between 50% and 69% of the proposals submitted and dollars requested, and the remaining 30% of the respondents obtained less than 50% of the proposals submitted and dollars requested.

Among the respondent institutions, 88% reported that they had fully functioning grants, sponsored projects, or research administration offices on their campuses; 9% reported that such offices were present, but may not be fully functioning; and 3% reported that no such offices existed on their campuses.

Descriptive statistics for the remaining thirty-two survey variables have been grouped together in five categories as follows: institutional (non-grant) financial resources provided in support of grant-related activity; other institutional (non-grant) resources provided in support of grant-related activity; institutional policies and practices influencing grant-related activity; grant-related training services provided by colleges and universities; and other grant-related services provided by colleges and universities.

The data in Table 2 suggest that colleges and universities do not routinely provide funding from their own resources for faculty development or renewal opportunities (only 16% of the respondents answered that it is *always* provided); for matching funds or other tangible forms of institutional commitment for proposed projects (17% reported *always*); for equipment or technology which support grants or sponsored activities (21% reported *always*); or funding for faculty to attend professional conferences, meetings, etc. (30% reported *always*). Many respondents reported that institutional funds are *sometimes* provided for these items, presumably on a case-by-case basis, as need and/or circumstances warrant. Moreover, for those respondents who reported that their institutions *always* or *sometimes* provide institutional funding for faculty travel to professional meetings, conferences, etc., only 8% reported that such funding is *always* sufficient; 62% reported such funding is *sometimes* sufficient; and 30% reported that such funding is *never* sufficient. Fifty-two percent of the respondents reported that their colleges and

universities *never* provide merit pay or another form of financial compensation from institutional sources as a reward for their successful grants, while 42% reported that such reward is *sometimes* provided, and 6% reported that such reward is *always* provided.

Table 3 provides information on the extent to which colleges and universities provide other institutional services to support grant development or other grant-related activities. As this table illustrates, the majority of colleges and universities *sometimes* provide reduced teaching duties, reduced advising responsibilities, or reduced committee assignments for faculty to prepare proposals or for faculty who have been awarded grants for externally funded projects. Similarly, most institutions *sometimes* provide graduate or research assistants to assist faculty in grant development activities or to work on successful grants. Finally, most colleges and universities *sometimes* provide additional administrative staff to help faculty engaged in grants activities. These data further show that few colleges and universities *always* offer these services, and many (in some cases, a substantial percentage) institutions *never* provide these services.

Table 2
Institutional (Non-Grant) Financial Resources Provided
by College and Universities

	Always	Sometimes	Never
Financial support for faculty travel to professional association conferences, meetings, workshops, or seminars	30	67	3
Equipment or technology (e.g., labs, computers) which support grants or sponsored activities	21	78	1
Financial support for faculty development or faculty renewal opportunities	16	81	3
Merit pay or other forms of personal financial compensation for faculty who receive grants for externally sponsored projects	6	42	52
Matching funds or other tangible forms of institutional commitment for proposals to external sponsors	17	79	4

Table 4 provides information on the extent to which colleges and universities provide institutional policies or practices which support grant activities by their faculty. This table shows that the majority of colleges and universities provide a streamlined administrative review process for proposals (75% reported this is *always* the case); 67% reported their institutions *always* provide an environment for faculty grant activity that is free from administration pressure; 62% reported their institutions *always* demonstrate their commitment to grants by consistently providing clearly visible support mechanisms; 57% reported that their colleges and universities *always* provided mission statements that clearly supported externally sponsored activities; and 54% reported that their colleges and universities *always* distribute at least a portion of the indirect

or administrative costs associated with successful grants to the project director or the academic department in which the project director is a member. Only 21% of the respondents reported that their institutions *always* provide a clearly visible and articulated system for recognizing and rewarding faculty who are successful in winning grants. Table 4 also shows that while a majority of the institutions in the sample consistently provide these policies or practices, substantial numbers of institutions do so only *somewhat,* and in some instances not at all. In fact, 22% of the respondents reported that their institutions do not provide a clearly visible and articulated system of recognizing and rewarding faculty for their grants successes; 19% reported that their institutions do not return even a portion of the indirect or administrative costs recovered from grants to the project directors or their departments, and 16% reported that their institutional mission statements do not show clear support for grants and externally sponsored activities.

Table 3
Other Institutional (Non-Grant) Resources Provided
by College and Universities

	Always	Sometimes	None
Released time from regularly assigned teaching duties for faculty to prepare proposals for grants for externally sponsored projects	6	62	32
Released time from student advising and /or committee assignments to prepare proposals for grants for externally sponsored projects	6	48	46
Reduced teaching duties for faculty who have been awarded grants for externally sponsored projects	9	72	19
Reduced student advising loads for faculty who have been awarded grants for externally sponsored projects	3	62	35
Reduced committee assignments for faculty who have been awarded grants for externally sponsored projects	3	56	41
Graduate or research assistants to help faculty in grant-seeking or grant-writing activities	0	58	42
Graduate or research assistants to help faculty who have been awarded grants for externally sponsored projects	8	73	19
Additional administrative or personnel support (e.g., secretarial help) to faculty engaged in grant development activity	8	70	22

Table 4
Institutional Policies and Practices
of College and Universities

	Always	Somewhat	None
A commitment to and value for grants and sponsored programs by consistently providing clearly visible support mechanisms	62	36	2
A mission statement which shows clear support for externally sponsored activities	57	27	16
An environment for faculty to pursue grant opportunities of their own choosing without administration pressure	67	32	1
A streamlined administrative review process which facilitates the processing of proposals for external funding	75	22	3
A clearly visible and articulated recognition and reward system for faculty who are successful in winning grants for externally sponsored projects	21	57	22
A process for returning at least a portion of the indirect or administrative costs associated with successful grants to the principal investigator or project director (or to the academic departments in which these faculty are members)	54	26	19

Respondents were asked to comment on the nature and frequency of services provided by their college or university grants, sponsored projects, or research administration offices. Their responses are illustrated in Table 5.

Table 5
Services Provided in
Grant Development Training Sessions or Workshops

	Always	Sometimes	Never
Familiarize faculty or staff with grant opportunities	55	36	9
Teach faculty or staff how to locate potential sponsors	50	38	12
Teach how to write competitive proposal narratives	40	44	16
Teach how to prepare reasonable budgets	52	36	12
Inform writers about the campus proposal approval process	66	28	6

The data in Table 5 suggest that training in familiarization with grants opportunities, locating potential sponsors, writing competitive proposals and budgets, and becoming and remaining informed about campus proposal approval processes is provided either *always* or *sometimes* at the respondents' institutions. Generally, less than 16% of the respondents suggested that such services are *never* available at their institutions.

Finally, respondents were asked to answer a series of questions about the nature and frequency of services offered at their colleges and universities. Their responses, presented below in Table 6, show that 76% reported that their grants offices *always* help to shepherd proposals through the campus approval process; 73% reported that their institutions *always* provide services to motivate faculty to engage in grant-seeking or grant-writing; 73% reported that their grants offices *always* provide timely notification of grants opportunities and deadlines; 65% reported that their grants offices *always* provide access to on-line computerized databases for grants

searches; 43% reported that editing services for proposals or reports are *always* available in the grants offices; 36% reported that their grants offices *always* maintain faculty profiles defining their research and scholarly interests; 41% reported that their grants offices *always* help to network faculty with similar interests; and 40% reported that their grants offices *always* provide boiler-plate sections for proposals. In contrast to these data, 22% reported that their grants offices *never* provide editing services; 14% reported that their grants offices *never* maintain faculty interest profiles; and 13% reported that access to on-line computerized databases is *never* provided.

Table 6
Services Provided by College or University
Grants, Sponsored Programs, or Research Administration Office

	Always	Sometimes	Never
Motivate faculty or staff to engage in grant-seeking and grant-writing	73	19	8
Provide editing services for proposals or reports	43	35	22
Shepherd proposals through the campus proposal approval process	76	21	3
Provide timely notification of grant opportunities and deadlines	73	24	3
Assist in networking faculty with similar grants or research interests	41	51	8
Maintain faculty profiles defining individual grants, research, or scholarly interests	36	50	14
Provide access to computerized on-line databases which facilitate searches for grants and sponsored project opportunities	65	22	13
Provide boiler plate sections of proposals (e.g., institutional description) to assist proposal writers	40	51	9

The fourth objective of the study was to determine if a predictive relationship exists among the resources, policies, services, or training provided by colleges and universities and achievement or success in grants acquisition, as measured by the percentage of proposals funded or the amount of dollars awarded in successful grants. In analyzing the data to address this objective, we acknowledge that the variables under study are not the only ones that may influence

grant activity or grant acquisition. Moreover, we recognize that the variables may not work as univariates in influencing grants success, but instead may work as multivariates. Suffice it to say that we chose these variables based on our review of the research literature and our own logic and understanding of grant development in higher education. Moreover, as the succeeding analyses and discussion will show, we used both univariate and multivariate tests to determine whether predictive relationships are observed.

We sought to address the predictive relationship between the input variables (resources, policies, services, etc.) and the outcomes (percent of proposals funded, amount of dollars awarded) through both univariate and multivariate analyses. First, a series of chi-square tests were run on the family of thirty-three independent variables found to influence success in grants acquisition. The concept of a family of variables was used to control for the compounding of possible Type I (alpha) errors. For a family tested at the $p<.05$ level of significance, two of the thirty-three variables would be expected to prove significant simply by chance. Thus, for the family of variables, at least three must prove significant for the family to be considered predictive of success in grants acquisition. Two analyses were run: one using categorical variables created from the *percentage of proposals funded* as the dependent variable, and another using the *percentage of dollars awarded* as the dependent variable. These categories have previously been described in Table 1.

In the first analysis, three instances of significance were observed at the $p<.05$ level. This suggests that the family of variables, when considered together, is a predictor of success in grants acquisition as measured by the *percentage of proposals funded* at the $p<0.05$ level of significance. The three variables that are significant include: equipment or technology which

support grants activities, the return of a least a portion of the indirect costs to the individuals responsible for getting the grant, and grants office training in the campus proposal approval process. The chi square statistics are reported in Table 7.

Table 7
Institutional Variables Significantly Related to Success in Grants Acquisition as Measured by the Percent of the Proposals Funded ($p<.05$)

Variable	X^2	df	n	p
Equipment or technology (e.g., labs, computers) which support grants or sponsored activities	7.29	2	94	0.026
A process for returning at least a portion of the indirect or administrative costs associated with successful grants to the principal investigator or project director (or to the academic departments in which these faculty are members)	15.163	4	94	0.004
Training about the campus proposal approval process	12.847	4	94	0.012

In the second analysis, ten variables were found to be significantly related to the criterion variable *percentage of dollars awarded.* The variables found to be significantly related to the criterion variable were: released time from regularly assigned teaching and advising duties and committee assignments to prepare grant proposals; reduced advising responsibilities and committee assignments to work on successful grants, graduate or research assistants both for proposal development and work on successful grants; the return of at least a portion of indirect costs associated with successful grants to the project director or the academic department in which the project director is a member; provision by the campus grants offices of proposal editing services, assistance in networking faculty with similar research or scholarly interests, and

access to on-line computerized data base searching services. These data are presented in Table 8.

In considering further analyses, we asked whether the variables used in the study as possible predictors were related to the dependent variable as independent characteristics or whether one or more of them were interchangeable. To answer this question, we converted the univariate variables already organized in the five groupings into scaled variables to determine if the scaled variables were significantly related to the dependent variable. To accomplish this, we constructed the scaled variables by using the following values: for univariate variables for which the response was *always*, we assigned a value of 3; for variables for which the response was *sometimes* (or *somewhat*), we assigned a value of 1; for variables for which the response was *never* (or *none*), we assigned a value of 0. We then grouped the variables according to the categories described earlier in this report (financial resources, other resources, policies and practices, training services, other services). What resulted is five groups of univariate variables organized as five scaled variables through the summing of their weights. The descriptive summaries appear below in Table 9.

Table 8
Institutional Variables Significantly Related to Success in Grants Acquisition as Measured by the Number of Dollars Awarded from Successful Grants ($p<0.05$)

Variable	X^2	df	n	p
Released time from regularly assigned teaching duties for faculty to prepare proposals for grants for externally sponsored projects	29.582	4	92	0.000
Released time from student advising and/or committee assignments to prepare proposals for grants for externally sponsored projects	26.915	4	92	0.000
Reduced student advising loads for faculty who have been awarded grants for externally sponsored projects	26.507	4	92	0.000
Reduced committee assignments for faculty who have been awarded grants for externally sponsored projects	35.074	4	92	0.000
Graduate or research assistants to help faculty in grant-seeking or grant-writing activities	8.916	2	92	0.012
Graduate or research assistants to help faculty who have been awarded grants for externally sponsored projects	10.839	4	92	0.028
A process for returning at least a portion of the indirect or administrative costs associated with successful grants to the principal investigator or project director (or to the academic departments in which these faculty are members)	10.990	4	92	0.027
Provide editing services for proposals or reports	18.535	4	92	0.001
Assist in networking faculty with similar grants or research interests	10.489	4	92	0.033
Provide access to computerized on-line databases which facilitate searches for grants and sponsored project opportunity	11.140	4	92	0.025

Table 9
Descriptive Statistics for Scaled Variables

Scaled Variable Group	N	Mean	Stan Dev
Institutional (non-grant) financial resources provided by colleges and universities	104	6.27	2.674
Other institutional (non-grant) resources provided by colleges and universities	104	6.30	3.229
Institutional policies and practices of colleges and universities	104	9.68	4.925
Services provided in grant development training sessions or workshops	104	6.14	5.010
Services provided by college or university grants, sponsored projects, or research administration offices	104	11.93	3.892

In Table 9, the first scaled variable, institutional financial resources, comprises five items weighted from 3 (*always*) to 0 (*never* or *none*). The mean response of 6.27 suggests that, on average, the resources in this scaled group are only *sometimes* provided. The second scaled variable, other institutional resources, comprises eight similarly weighted items. Its mean of 6.30 suggests that, on average, the resources in this scaled group are also only *sometimes* provided. The third scaled variable, institutional policies and practices, comprises six items and shows a mean of 9.68, which suggests that, on average, the items in this scaled group are *sometimes* provided with one or more of the items being provided *always*. The fourth scaled variable, grants training services, comprises five items and shows a mean of 6.14, which suggests that the items in this scaled group are *sometimes* provided .The final scaled variable, other college services,

comprises eight items and shows a mean of 11.93. This suggests that, on average, the items in this scaled group are *sometimes* provided. In summary, these results suggest that all of the scaled groupings are provided, on average, at least *sometimes*. Based on the mean values observed, it appears that the discrete items for institutional policies and practices, grants training services, and other college services appear to be provided more frequently than the discrete items for the financial and other resources scaled variables.

Having converted the univariate variables to scaled variables, we conducted a series of Pearson correlation tests to determine if there was a statistical relationship between the different categories of scaled variables and success in grants acquisition. Two correlations were run; the first using percent of proposals funded as the dependent variable, and the second using the amount of dollars awarded as the dependent variable. No statistically significant relationships were observed at the $p<.05$ level using the percentage of proposals funded as the dependent variable. However, when we used the amount of dollars as the dependent variable, we observed that selected institutional (non-grant) resources provided by colleges and universities (which comprised released time to prepare proposals; reduced teaching, advising, and committee assignments to work on funded grants; graduate or research assistants; and other administrative help) were positively related ($r=.366$, $p<.05$). Using the same criterion measure, we further observed that grants training services and grants success were inversely related ($r=-.235$, $p<.05$). These findings suggest that released time and reduced faculty assignments, graduate assistants, and other forms of administrative help often are associated with success in grants acquisition as measured by dollars awarded in funded grants. The inverse correlation between training services and grants success may imply that faculty grants-getters are recruited or attracted to their

institutions and are not developed as a result of training.

We conducted a series of analyses to further test whether the independent variables used in the study worked in a multivariate fashion rather than in a univariate mode. These included a series of eight multivariate analyses as follows: stepwise multiple regressions using the univariate and scaled variables to predict success in grants acquisition as measured by the percentage of proposals funded and dollars awarded, and two-group discriminant analyses using the univariate and scaled variables to predict success in grants acquisition as measured by dichotomized versions of the two criterion variables, percent of proposals funded and amount of dollars awarded.

In the multiple regression analyses with the univariate variables as predictors, the stepwise model was applied to both dependent measures. The results of the stepwise multiple regression using the univariate variables to predict percentage of proposals funded are generally consistent with the chi-square analyses, but still somewhat disappointing. Only two of the independent variables showed sufficient relationship with the dependent variable to freely enter the stepwise process. The analysis explained nearly 11% of the variance and two variables were found to be significantly predictive of success. The results of this analysis are reported in Table 10.

Table 10
Summary of Multiple Regression Results:
Univariate Variables Used to Predict Grants Success
as Measured by the Percentage of Proposals Funded

Variable	Beta	F-Ratio	p
Equipment or technology (e.g., labs, computers) which support grants or sponsored activities	-0.2360	5.754	0.017
Reduced student advising loads for faculty who have been awarded grants for externally sponsored projects	0.2332	5.620	0.019

In Table 11, we show the results of the stepwise regression analysis using the univariate variables to predict success in grants acquisition as measured by the amount of dollars awarded. The analysis of variance produced of value of $F(2,101)=13.01$, $p<.01$. The coefficient of multiple determination ($R^2=.2$) further showed a positive and significant, but not very predictive, relationship. The data in Table 11 further seem to imply stand-in variables, that is, a single variable representing another variable. For example, the first variable in the stepwise regression, the provision of reduced student advising responsibilities, may represent all released time without qualification. The second variable, the provision of services to help network faculty with similar research/scholarly interests, may represent pressure in the environment (note the negative beta). Since the relationship observed has little magnitude, the logic of the univariates that entered the regression appears less important than the fact that some were entered.

Table 11

Summary of Multiple Regression Results:
Univariate Variables Used to Predict Grants Success
as Measured by the Amount of Dollars Awarded in Funded Grants

Variable	Beta	F-Ratio	p
Reduced student advising loads for faculty who have been awarded grants for externally sponsored projects	0.3720	17.465	0.000
Assist in networking faculty with similar grants or research interests	-0.2301	6.681	0.011

The results of using the scaled variables to predict the percentage of proposals funded was also somewhat disappointing. None of the scaled variables showed sufficient relationship to freely enter the stepwise regression process. Moreover, when all the scaled variables were forced into the regression, no significant relationship was observed. A coefficient of multiple determination (R^2=.04) clearly supported this finding.

Using the scaled variables to predict grants success as measured by the amount of dollars awarded was more promising. The analysis of variance produced a value of $F(2,101)=11.32$, $p<.01$. The coefficient of multiple determination (R^2=.18) showed a positive and significant, but not very predictive, relationship. These data are shown in Table 12.

Table 12
Summary of Multiple Regression Results:
Scaled Variables Used to Predict Grants Success
as Measured by the Amount of Dollars Awarded in Funded Grants

Variable	Beta	F-Ratio	P
Other institutional (non-grant) resources provided by colleges and universities	0.3580	15.825	0.000
Services provided in grant development training sessions or workshops	-0.2212	6.044	0.015

The data in Table 12 show results that are somewhat similar to those found in Table 11. The predictive relationship is small, but greater than would have occurred simply by chance. The analysis suggests that the provision of selected institutional resources (e.g., released time, reduced loads) does seem to pay off in grants acquisition success as measured by the amount of dollars awarded in funded grants. Moreover, as was observed in earlier analyses, the provision of training services bears an inverse relation to grants success. We suggest once again that this implies that college and university faculty skilled in obtaining grants are recruited or attracted to the institution, and not developed as a result of institutional training.

The discriminant analyses were performed using the thirty-three univariate variables employed throughout the study. In the first analysis, the univariates were examined to determine if they could classify institutions into one of two groups, based on the mean for each: (1) institutions which were awarded more than 68% of the proposals they had submitted and (2) institutions which were awarded 68% or less of the proposals they had submitted. In running this analysis, we found that no single variable was sufficiently rigorous to freely enter the model.

Accordingly, we forced all of the variables into the model simultaneously. The results showed that the model accurately classified fifty-five cases and inaccurately classified thirty-seven cases. For purposes of prediction, these results proved too inaccurate to be useful.

The second discriminant analysis was performed to determine whether the univariate variables were useful in classifying institutions as to the amount of dollars awarded in funded grants. For purposes of classification, a similar distribution was used: (1) institutions which received more than $32.7 million (the mean) in funding and (2) institutions which had received $32.7 million or less in funding. In running this analysis, we found that accurate classifications were made in sixty-eight cases, and inaccurate classifications were made in only fourteen cases. This ratio was determined to be sufficiently accurate to prove useful as a predictive model. Six univariate variables were found to enter the model freely. They were released time from advising and committee assignments to work to prepare proposals; grant development training, both in proposal writing and budget development; and services provided by the campus grants office in shepherding proposals through the administrative approval process, in developing faculty profiles, and in helping to network faculty with similar research or scholarly interests.These variables and the discriminant coefficients are presented in Table 13 below.

Table 13
Summary of Discriminant Analysis Results:
Univariate Variables Used to Predict Grants Success
as Measured by the Amount of Dollars Awarded in Funded Grants

Variable	Coefficient
Released time from student advising and/or committee assignments to prepare proposals for grants for externally sponsored projects	0.2919
Grant development training services in proposal writing	-0.1382
Grant development training services in budget development	0.2086
Assist in shepherding proposals through the administrative approval process	-0.2012
Assist in developing faculty profiles	-0.0980
Assist in networking faculty with similar grants	0.1131

The third discriminant analysis used the scaled variables to predict classification in the groups defined above, as measured by the percent of proposals funded. Once again, however, none of the scaled variables freely entered the model, so they had to be forced in simultaneously. And, once again, the results were disappointing. The model accurately predicted classification in twenty-six cases, and inaccurately predicted classification in sixty-six cases. This proved too inaccurate to be useful as a predictive model.

The final discriminant analysis used the scaled variables to predict classification in the groups defined above, as measured by the amount of dollars awarded in funded grants. In running this analysis, we were again forced to enter all the variables into the model simultaneously. We

found that the model accurately predicted classification in sixty cases, and inaccurately predicted classification in twenty-two cases. This ratio was determined to be too inaccurate to prove useful as a predictive model.

Discussion

The descriptive data suggest that most colleges and universities consistently support the grant-related activities of their faculty more in ways that do not require the expenditure of institutional resources and less in ways that do. This confirms earlier findings by Monahan (1993, p.13). We note this because of the finding that the majority of respondents reported that their institutions *always* provided clearly visible support systems and mission statements that supported externally funded projects, pressure free environments, and streamlined administrative procedures for proposal approval and clearance. In contrast, however, the majority of respondents reported that their institutions only *sometimes*, and in some cases, *never*, provided from within their own financial resources released time to prepare proposals, reduced faculty loads to work on successful grants, funds for faculty travel or faculty development, equipment or technology to supports grants activity, merit pay, matching funds, graduate or research assistants, or other administrative support. We further note an apparent discrepancy in the data which, on the one hand, reports that institutions *always* show a commitment to and value for grants activity by consistently providing clearly visible support mechanisms, and on the other hand, suggests strongly that such "clearly visible support mechanisms" are not *always* financially supported from within the institutions' resources. These findings suggest that institutions may prefer to look to successful grants to fund released time, reduced faculty loads, and other resource-consuming incentives as a way of avoid having to expend institutional resources.

Another finding that appears consistent with issues in the national debate is the report that institutions infrequently provide clearly visible and articulated recognition and reward systems, including merit pay, for faculty who are successful in winning externally funded grants. Moreover, the data show that many institutions (45%) only *sometimes* or *never* return even a portion of the indirect costs derived from successful grants to those individuals and departments who were instrumental in acquiring the grants.

The descriptive data further suggest that campus grants, sponsored projects, or research administration offices are helpful both in providing training in grant-related activities and in providing other services to faculty which support their grant-seeking and grant-writing efforts.

The question that remains is whether the provision of any of these institutional resources, policies, services, or training has any measurable effect on the acquisition of grants from external sources. It is not unreasonable for college and university administrators to pose this question before embarking on a path which requires the expenditure of considerable financial and other resources.

Few of the univariate or multivariate analyses (i.e., chi-square, correlation, regression, discriminant) proved useful in showing a predictive relationship among the independent variables and success in grants acquisition as measured by the percent of proposals funded. Those which did, however, suggested a small, yet significant, relationship between the predictor variables of (a) equipment and technology for grant-related activities; (b) return of a portion of the indirect costs to faculty or sponsoring departments; (c) grants training in the campus proposal approval process; and (d) reduced loads for student advising and committee work to implement successful grants. Other analyses suggested that some of the variables under study do have a significant

predictive relationship with success in grants acquisition as measured by the amount of dollars awarded in funded grants. The chi-square and regression analyses of both the univariate and scaled variables suggest that the provision of institutional (non-grant) resources for released time to prepare proposals, reduced faculty loads to work on successful grants, equipment and technology for grant-related activity, and graduate and research assistants are positively related with success in grants acquisition as measured by amount of dollars awarded. Moreover, the return of indirect cost proceeds is positively related to this criterion. Only one of the four discriminant analyses we ran proved useful, and it was consistent with our earlier findings that the provision of selected institutional (non-grant) resources and services did possess a significant predictive relationship with success in grants acquisition. Finally, the analyses show an inverse relationship among grants editing services, computerized data base services, and faculty networking services and success in grants acquisition as measured by the amount of dollars awarded. We believe that this last finding suggests that grants services, while helpful, may not be among the most influential factors in helping to acquire grants from external sponsors.

Summary

The results of this study suggest that most colleges and universities provide more in the form of policies, practices, grants training and other grants services than financial and other institutional resources (e.g., released time) as incentives for faculty to engage in grant-related activity. Nevertheless, the data suggest that, when measuring success in grants acquisition by the amount of dollars awarded in funded grants, there is a small, yet significant, predictive relationship between selected variables and grants success.

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